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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/378,108	08/20/1999	OLAF DICKER	99P7740US	8733

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SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
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EXAMINER	
FERRIS, DERRICK W	

ART UNIT	PAPER NUMBER
2663	

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/378,108	DICKER ET AL.	
	Examiner	Art Unit	
	Derrick W. Ferris	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 January 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 August 1999* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. **Claims 1-21** as amended are still in consideration for this application. Applicant has amended claims 1, 3, 4, 7, 9, 11-16, and 21. Applicant has canceled claim 22.

2. Examiner does **not withdraw** the obviousness rejection to *Deutsch* in view of *Kashorda* for Office action filed 10/08/03. In response to applicant's arguments, examiner notes that a spectral separation between a first and a second channel are inherent given the Adaptive Frequency Plan taught at column 6, lines 27-67 and illustrated in figure 5 of *Deutsch*. Specifically, at issue is the following claim limitation (or equivalent):

> "*determine based on interference of the first channel during transmission a spectral separation between the first channel and at least one other channel, and select a unique channel frequency for the at least other channel based on the first channel and the determined spectral separation of the at least one other channel*".

In particular, *Deutsch* teaches providing spectrum separation for each frequency, e.g., see column 2, lines 37-59 and column 6, lines 25-26. Specifically, *Deutsch* teaches using channel substitution to eliminate interference (e.g., see column 3, lines 20-25). For example, as taught by the sequence of B1, B2, B3, B4, and B5, if time slot 3 (i.e., B3) is bad due to interference then B3 is replaced with C3 to eliminate interference and produce the new frequency hop sequence of B1, B2, C3, B4, and B5 (e.g., see column 6, lines 5-24). Note that the new frequency hop scheme is not stored at the time of manufacture (only the original is) since the test occurs during the operation of the system. Since spectrum separation is inherent given the adaptive frequency plan, when a new frequency is selected, e.g., C3, the new frequency is still isolated from the existing frequencies (e.g., see figure 5). In other words note e.g., that for slots 1 and 2 and

groups A-D that each frequency is isolated from the other frequencies such that spectral separation is inherently taught by the reference.

In addition, also see the new rejection which further teaches the claims as necessitated by amendment. For the new rejection the examiner assumes a reasonable but broad interpretation of "spectral separation". Not recited in the claims is the further underlined concept found on applicant's page 8:

> *System 10 selects a unique frequency F1, F2, F3, F4 to be used for each of channels 12a-12d as illustrated in FIGURE 4. Such frequencies may also be changed from frame to frame by utilizing a frequency hopping scheme such as discussed in conjunction with FIGURES 2 and 3. Each frequency utilized for channels 12a-12d is typically selected to maintain spectral separation between channels 12a-12d. Thus, for example, it is particularly advantageous to select F2 from a different subset than F1. Such spectral separation ensures that, should the frequency F1 used over channel 12a encounter interference, frequencies F2, F3, and F4 will not encounter interference from that same spectral band.*

Applicant is encouraged to file a continuation and further define spectral separation and further include the limitation that at least one other channel F2 is selected from a different subset than the first channel F1. It is not clear from the *Gendel* reference that F2 is selected from a different segment, instead the references in combination teach two separate frequencies that may reside on either the same segment or a different segment, however, both of these frequencies still maintain "spectral separation" from one another using a reasonable but broad interpretation. **Should applicant include this further limitation then the examiner would remove both rejections (however the examiner would also have to perform another search/request for consideration thus requiring a continuation to be filed since the current action is made final as necessitated by amendment).**

Claim Objections

3. **Claim 1** is objected to because of the following informalities: please remove the second (and redundant) occurrence of "the" found on line 13. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,848,095 to *Deutsch et al* ("*Deutsch*") and "A Spectrum Efficient Technique for Cordless Telephone Access to ISDN" by *Kashorda et al.* ("*Kashorda*")

As to **claims 1, 7, 15 and 21**, *Deutsch* discloses an adaptive frequency hopping method for using pre-established frequency assignments in a plurality of time slot groups which are separated by a minimum distance (i.e., "spectral separation" using a reasonable but broad interpretation). Taught is a communication between a remote unit 14 and a base unit 12 in a wireless telephone system such as a cordless phone system [column 5, lines 59-63] (see claim 1 with further emphasis for a cordless system with respect to a wireless telephone system). Shown in figure 4, each frequency of a frequency set corresponds to a channel (i.e., a spectrum is broken up into 200 different sets of frequency/channel pairs). Using the adaptive frequency plan described at column 6, lines 54-64, each of the 200 channels are further divided into 10 subbands (step 1) where a random sequence of the subbands is created for each group (i.e., a group such as Group A

shown in figure 3). Hence shown in figure 6 are 5 random sequences of the 10 subbands for a total of 50 frequency hops (steps 2-3) using 50 channels (these channels are not channel/links as recited by applicant). Next, for each sequencing, a channel is randomly selected for each subband/sequence (step 6). The key is that for each group (i.e., the four groups: Group A – Group D), the random sequence is advanced one place in a random sequence (step 4), which is key since this ensure a "spectral separation" between groups [column 2, lines 54-63].

Examiner notes that the reference is silent or deficient to a "plurality of individual communications channels between a first data station and a second data station" (e.g., channels/links 12(a)-12(d) as disclosed in relation to applicant's specification). Examiner notes the reference teaches that a remote unit 14 communicates with base station 12 through RF transceiver 210 which receives signals from and transmits signals to base station 12 through antenna 22 (i.e., it is not clear whether these radio signals are in parallel using multiple lines/channels, or serial using a single line/channels) [column 4, lines 23-26]. Examiner notes that it would have been obvious to a skilled artisan prior to applicant's invention to use more than one channel between a radio base station and a remote station for transferring data, the motivation being that a higher bandwidth capacity can be formed by using more than one data channel at a time. This is further emphasized in the background of *Kashorda* (and not the main body of the article which discloses multiplexing both voice and data over a single channel), disclosing that in particular the cordless telephone user may only have on demand access to a variable capacity data channel (i.e., multiple logical channels), where the capacity is dynamically

allocated in accordance with user demands [page 15]. Thus in choosing another unique carrier frequency for more than one channel using the teachings of *Deutsch*, examiner notes that for each particular time slot that the next channel must be on a different group then the previous channel such that the two channels are "spectrally seperated". For example, in using figure 3 as a guideline, for a first time slot 1, if a first link is using A1 then a second channel/link must choose from B1, C1, or D1 in that time slot. Examiner furthermore notes that if interference occurs on A1 for a first channel/link where the first channel/link is forced to used B1 (as an example) the second link must a different channel which cannot already be assigned (see step 6 column 6, line 65).

As both references disclose wireless communications between a base station and a remote unit, and more specifically, cordless communications, examiner notes a motivation to combine the subject matter as a whole for both references.

As to **claims 2 and 19**, both references disclose operating in duplex. *Deutsch* discloses time division duplexing (TDD) [column 4, line 62].

As to **clams 13 and 16**, *Deutsch* discloses using a frequency offset (i.e., minimum distance of 2 MHz). Using a reasonable but broad interpretation of the claim language, the minimum distance is optimal spectral spacing [column 2, lines 54-64; column 6, lines 26-36].

As to **claims 5 and 12**, *Deutsch* discloses a frequency hopping scheme.

As to **claims 3,4, and 6**, *Deutsch* discloses a method to "model interference encountered over individual channels between the data stations" using a reasonable but broad interpretation of "model" (i.e., examiner notes an "adaptive" method given

applicant's written disclosure on page 8, line 23). In particular, *Deutsch* discloses modeling interference through monitoring a link using the RSSI (i.e., an error rate) as well as "signals indicating channel quality" [column 5, lines 45-51]. Thus *Deutsch* teaches a step to "model interference". Examiner also notes a broad but reasonable interpretation of "select parameters" that minimize the loss of information. In particular, examiner notes that the frequency hopping scheme proposed by *Deutsch* minimizes the loss of information. Examiner notes that it would have been obvious to one skilled in the art to adjust the parameters in the algorithm (i.e., select parameters) where these parameters minimize the loss of information over each of the individual channels. For example, such parameters to modify are disclosed by *Deutsch* at column 6, lines 40-41. Motivation for adjusting the parameters is disclosed at column 7, lines 1-2. Thus *Deutsch* also discloses "select parameters" that minimize the loss of information over each of the individual channels. Examiner would like to furthermore point out that applicant does not claim particular ways of modeling interference of selecting parameters thus leaving room for a very broad but reasonable interpretation for the recited claimed subject matter.

As to **claims 9, 10, 17 and 18**, see the rejection for claim 6.

As to **claim 8**, the throughput of the combine channels/links is equal to the maximum throughput using a reasonable but broad interpretation of the claim.

As to **claims 11 and 20**, *Deutsch* discloses determining parameters at predetermined intervals of time using a reasonable but broad interpretation.

As to **claim 14**, *Deutsch* also discloses using a table for selecting frequencies from a subband [column 5, lines 41-44].

6. **Claims 1-21** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,115,407 to *Gendel et al* ("*Gendel*") and "A Spectrum Efficient Technique for Cordless Telephone Access to ISDN" by *Kashorda et al.* ("*Kashorda*")

As to **claims 1, 7, 15 and 21**, *Gendel* discloses a frequency hopping communication apparatus for modifying frequency hopping sequence in accordance with counted errors. In particular, figure 1 shows a first data station as 102 and a second data station as 104 or 106 respectfully. With respect to the limitation:

"*determine based on interference of the first channel during transmission a spectral separation between the first channel and at least one other channel, and select a unique channel frequency for the at least other channel based on the first channel and the determined spectral separation of the at least one other channel*".

See figures 2a and 2b. The above limitation is met since if one frequency is bad (e.g., f15 for segment 2 shown in figure 2a of *Gendel*) then all the frequencies (e.g., f14-f20) for that segment are not chosen (e.g., see column 7, lines 30-33). Thus with respect to the limitation, a unique channel frequency for the at least remainder one other channel based on the first channel and the determined spectral separation of the at least one other channel is taught since all frequencies for the first segment due to interference are replaced by frequencies in a different segment/band (i.e., an unused segment/band). Thus it does not matter if a first and second channel frequency are in the same segment since the limitation is still met using a reasonable but broad interpretation of spectral separation.

Examiner notes that the reference is silent or deficient to a "plurality of individual communications channels between a first data station and a second data station" (e.g.,

channels/links 12(a)-12(d) as disclosed in relation to applicant's specification). In particular, *Gendel* shows one general communication link (i.e., data and control link 110) between the two stations as shown in figure 1 (e.g., see column 7, lines 3-4). Examiner notes that it would have been obvious to a skilled artisan prior to applicant's invention to use more than one channel between a radio base station and a remote station for transferring data, the motivation being that a higher bandwidth capacity can be formed by using more than one data channel at a time. This is further emphasized in the background of *Kashorda* (and not the main body of the article which discloses multiplexing both voice and data over a single channel), disclosing that in particular the cordless telephone user may only have on demand access to a variable capacity data channel (i.e., multiple logical channels), where the capacity is dynamically allocated in accordance with user demands [page 15].

As to **claims 2 and 19**, both references disclose operating in duplex e.g., *Gendel* discloses duplexing [column 8, line 25].

As to **clams 13 and 16**, *Gendel* discloses separating the frequencies optimally as shown in figure 2a and column 7, lines 27-52.

As to **claims 5 and 12**, see *Gendel* column 8, lines 7-12.

As to **claims 3,4, and 6,** *Gendel* discloses a method to "model interference encountered over individual channels between the data stations" using a reasonable but broad interpretation of "model", e.g., see column 4, lines 26-45 and column 10, line 53 – column 11, lines 24.

As to **claims 9, 10, 17 and 18**, see the rejection for claim 6.

As to **claim 8**, the throughput of the combine channels/links is equal to the maximum throughput using a reasonable but broad interpretation of the claim.

As to **claims 11 and 20**, *Gendel* discloses determining parameters at predetermined intervals of time using a reasonable but broad interpretation since the error rate is determined at predetermined time intervals (e.g., see column 7, lines 11-13).

As to **claim 14**, *Gendel* also discloses using a table for selecting frequencies from a subband [column 12, lines 29-30].

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US006246713B1 discloses variable bandwidth which provides spectrum separation as well as variable bandwidth for multiple channels e.g., see figure 2.
- US006130885A discloses placing the channels into two groups of frequencies.
- US004716573 teaches and re-enforces the concept of checking for bit error rates before assigning channels in a system.

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derrick W. Ferris whose telephone number is (703) 305-4225. The examiner can normally be reached on M-F 9 A.M. - 4:30 P.M. E.S.T.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on (703) 308-5340. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-3900.

Derrick W. Ferris
Examiner
Art Unit 2663

DWF

CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600 1/23/04